

IN THE CLAIMS:

1. An electromagnetic clutch structure for use in a driving force distribution system comprising:

a first electromagnetic clutch for transmitting torque from a right output shaft connected to a right driven wheel to a left output shaft connected to a left driven wheel; and

a second electromagnetic clutch for transmitting torque from the left output shaft connected to the left driven wheel to the right output shaft connected to the right driven wheel, wherein the selective operation of the first and second electromagnetic clutches transmits torque from the output shaft on the inside of a turn to the output shaft on the outside of the turn;

a core housing a first coil and a second coil;

wherein the first electromagnetic clutch comprises a first armature placed on the right side of the core housing the first coil; and

wherein the second electromagnetic clutch comprises a second armature placed on the left side of the core housing the second coil.

2. The electromagnetic clutch structure of claim 1, wherein the structure is provided within a housing in a vehicle.

3. The electromagnetic clutch structure of claim 2, further comprising a controller for controlling engagement of the first electromagnetic clutch and the second electromagnetic clutch.

4. The electromagnetic clutch structure of claim 3, wherein when the vehicle turns right, the first electromagnetic clutch is engaged and the first

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armature is urged leftward thereby reducing an air gap between the first armature and the core.

5. The electromagnetic clutch structure of claim 3, wherein when the vehicle turns right, the first electromagnetic clutch is engaged and the first armature is urged leftward thereby reducing power consumption of the first electromagnetic clutch.

6. The electromagnetic clutch structure of claim 3, wherein when the vehicle turns left, the second electromagnetic clutch is engaged and the second armature is urged rightward thereby reducing an air gap between the second armature and the core.

7. The electromagnetic clutch structure of claim 3, wherein when the vehicle turns left, the second electromagnetic clutch is engaged and the second armature is urged rightward thereby reducing power consumption of the second electromagnetic clutch.

8. The electromagnetic clutch structure of claim 2, further comprising a carrier member connected to the housing.

9. The electromagnetic clutch structure of claim 8, wherein a rotational speed of the carrier member is increased relative to a rotational speed of the right output shaft.

10. The electromagnetic clutch structure of claim 1, wherein a rotational speed of the left driven wheel is increased relative to a rotational speed of the right driven wheel such that when the vehicle is turning right, the following equation is satisfied: rotational speed of left driven wheel/rotational speed of right driven wheel is approximately 1.167.

11. The electromagnetic clutch structure of claim 8, wherein when the vehicle turns left, a rotational speed of the carrier member is reduced and wherein a rotational speed of the right driven wheel is increased relative to a rotational speed of the left driven wheel such that the following equation is satisfied: rotational speed of right driven wheel/rotational speed of left driven wheel is approximately 1.143.

12. An electromagnetic clutch structure in a driving force distribution system comprising:

a first electromagnetic clutch that transmits torque from a right output shaft connected to a right driven wheel to a left output shaft connected to a left driven wheel; and

a second electromagnetic clutch that transmits torque from the left output shaft connected to the left driven wheel to the right output shaft connected to the right driven wheel, selective operation of the first and second electromagnetic clutches transmitting torque from the output shaft that is on the outside of a turn to the output shaft that is on the inside of the turn;

a first core housing a first coil and a second core housing a second coil;

wherein the first electromagnetic clutch comprises a first armature placed on the left side of the first core housing the first coil; and

wherein the second electromagnetic clutch comprises a second armature placed on the right side of the second core housing the second coil.

13. The electromagnetic clutch structure of claim 12, wherein the structure is provided within a housing in a vehicle.

14. The electromagnetic clutch structure of claim 13, further comprising a controller for controlling engagement of the first electromagnetic clutch and the second electromagnetic clutch.

15. The electromagnetic clutch structure of claim 14, wherein when the vehicle turns right, the second electromagnetic clutch is engaged and the second armature is urged leftward thereby reducing an air gap between the second armature and the core.

16. The electromagnetic clutch structure of claim 14, wherein when the vehicle turns right, the second electromagnetic clutch is engaged and the second armature is urged leftward thereby reducing power consumption of the second electromagnetic clutch.

17. The electromagnetic clutch structure of claim 14, wherein when the vehicle turns left, the first electromagnetic clutch is engaged and the first armature is urged rightward thereby reducing an air gap between the first armature and the core.

18. The electromagnetic clutch structure of claim 14, wherein when the vehicle turns left, the first electromagnetic clutch is engaged and the first armature is urged rightward thereby reducing power consumption of the first electromagnetic clutch.

19. The electromagnetic clutch structure of claim 14, further comprising a carrier member connected to the housing.

20. The electromagnetic clutch structure of claim 19, wherein when the vehicle turns right a rotational speed of the carrier member is reduced.

21. The electromagnetic clutch structure of claim 12, wherein a rotational speed of the right driven wheel is increased relative to a rotational speed of the left driven wheel when the vehicle is turning right.
22. The electromagnetic clutch structure of claim 19, wherein when the vehicle turns left, a rotational speed of the left driven wheel is increased relative to a rotational speed of the right driven wheel

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